RTCA Special Committee 186, Working Group 5

ADS-B UAT MOPS

Meeting #6

UAT MESSAGE GENERATOR SYSTEM DEVELOPMENT DESIGN OVERVIEW AND STATUS

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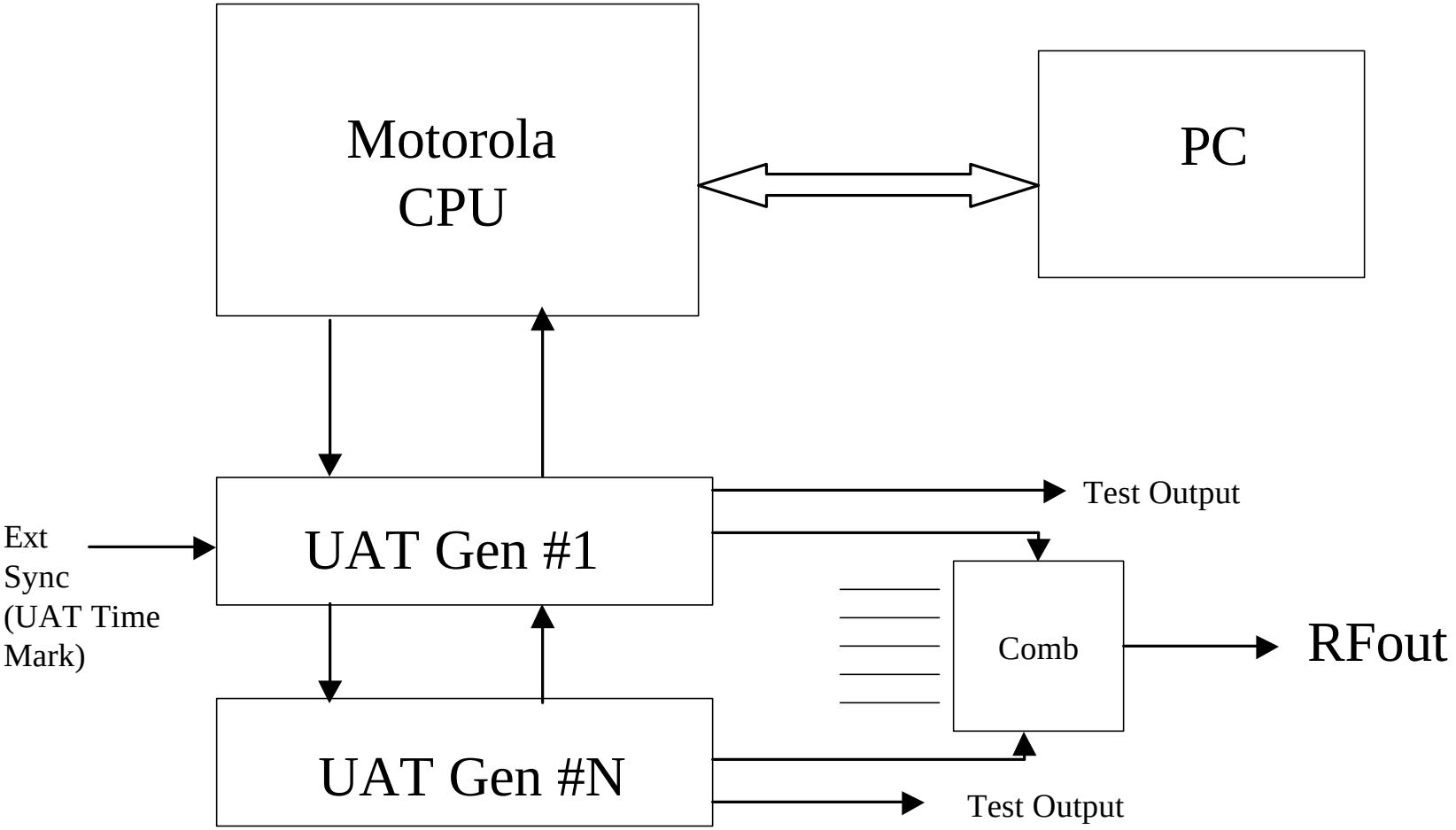
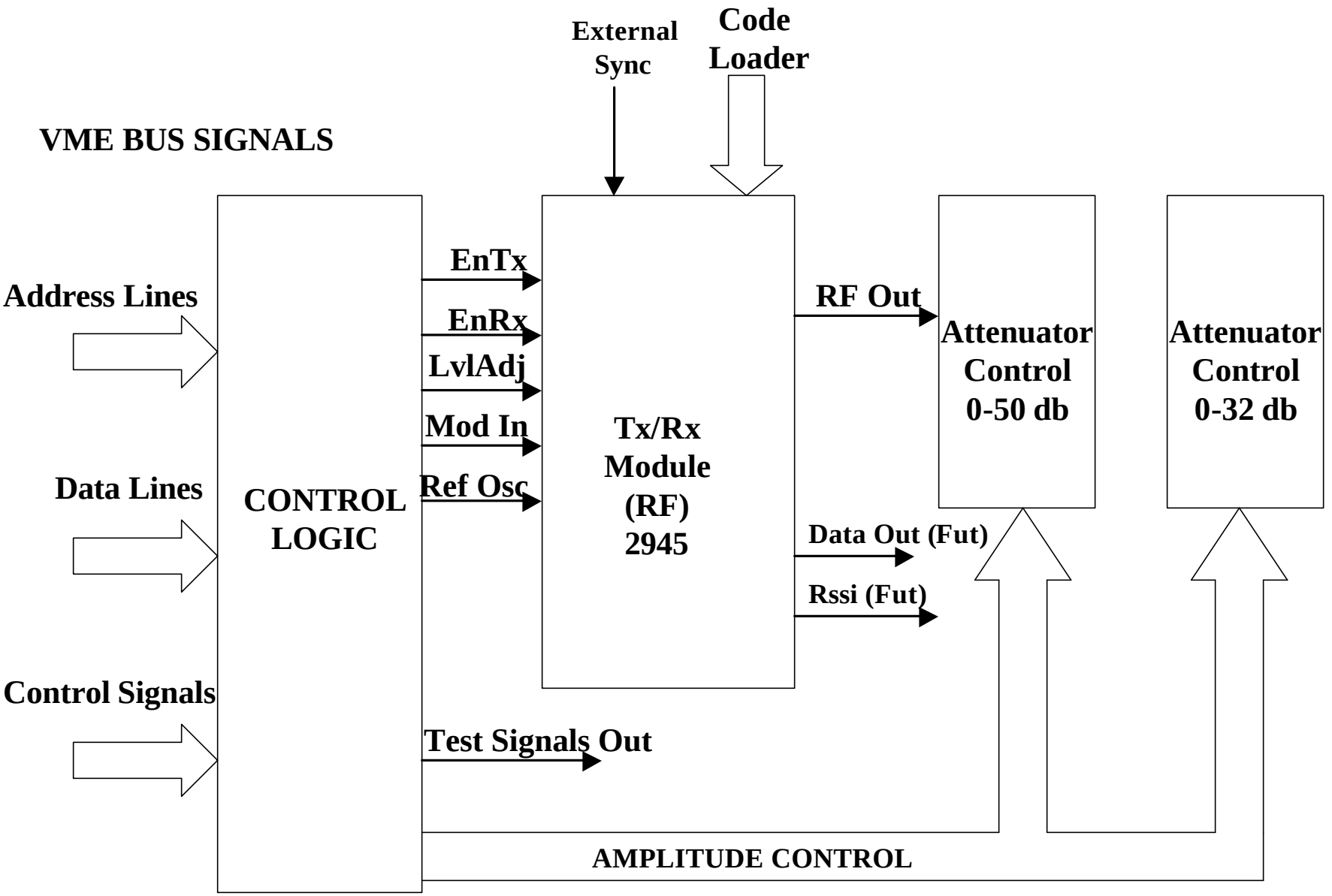
SUMMARY

Action Item 3-25 requested the FAA Technical Center to perform an initial investigation to define and and develop an RF UAT Message Generator to simulate high-density scenarios. This Working Paper summarizes the status of that effort.

Overall Characteristics

- Modular Design
  - Each Module is completely independent
  - Up to 8 per chassis
- PC control
  - Timing and Message content
  - Can be externally synchronized


Motorola
CPU
PC
Ext
Sync
(UAT Time
Mark)
UAT Gen #1
Test Output
Comb
RFout
UAT Gen #N
Test Output


External Sync
Code Loader
VME BUS SIGNALS
Address Lines
Data Lines
Control Signals
CONTROL LOGIC
EnTx
EnRx
LvlAdj
Mod In
Ref Osc
Test Signals Out
Tx/Rx Module (RF) 2945
RF Out
Data Out (Fut)
Rssi (Fut)
Attenuator Control 0-50 db
Attenuator Control 0-32 db
AMPLITUDE CONTROL

Characteristics (2)

- Frequency Of Operation
  - Each Module independent
  - Controllable in 100khz steps
  - Currently set to 981.0 MHz
- Modulation and Data
  - As defined in DRAFT UAT MOPS Specifications

Characteristics (3)

- Output Power
  - Each Message independent
  - Controllable in 1db steps
  - Maximum output –20dbm
  - Dynamic Range – 80db
- RF Spectrum
  - Within Limits of DRAFT UAT MOPS Specifications
  - May require a filter at output

Characteristics (4)

- Message Types
  - Uplink, Long ADS-B, Short ADS-B
  - Each Message independent
  - Data is programmable
  - Can be externally synchronized

Characteristics (5)

- Message Capacity
  - Each module has 2k of RAM
- Memory Usage
  - Uplink Message
    - Approx. 148 words
  - ADS-B Short Message
    - Approx. 11 words
  - ADS-B Long Message
    - Approx. 15 words

Characteristics (6)

- Typical Maximums per module
  - 1 - Uplink Message
  - 70 – ADS-B Short Messages
  - 70 – ADS-B Long Messages

STATUS

- Completed RF component validation
- Hardware fabrication nearly complete. Cards are due to be completed this week along with backplane wiring.
- Hardware logic programming in progress.
- Software – operating and development system loaded and functional. Diagnostic software for initial hardware debugging complete.
- Hardware control software in progress.